

(12)特許協力条約に基づいて公開された国際出願

訂正版

(19)世界知的所有権機関  
国際事務局



(43)国際公開日  
2005年1月20日(20.01.2005)

PCT

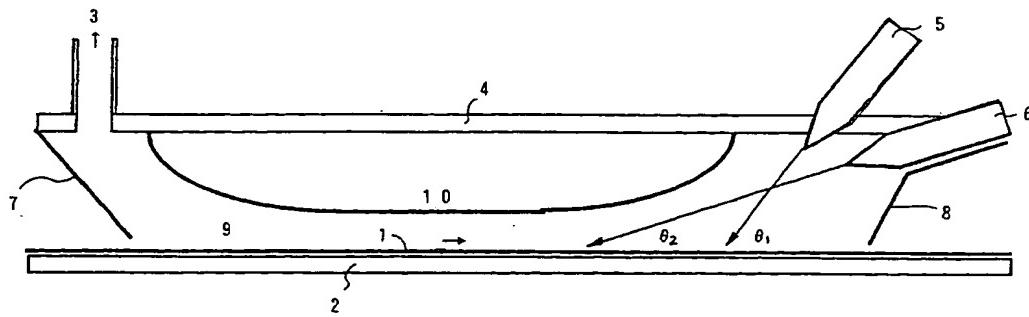
(10)国際公開番号  
WO 2005/005686 A1

- (51)国際特許分類<sup>7</sup>: C23C 16/40,  
16/455, B01J 35/02, C01G 23/07
- (21)国際出願番号: PCT/JP2004/009903
- (22)国際出願日: 2004年7月6日(06.07.2004)
- (25)国際出願の言語: 日本語
- (26)国際公開の言語: 日本語
- (30)優先権データ:  
特願2003-272936 2003年7月10日(10.07.2003) JP
- (71)出願人(米国を除く全ての指定国について): 住友チタニウム株式会社(SUMITOMO TITANIUM CORPORATION)[JP/JP]; 〒6608533 兵庫県尼崎市東浜町1番地 Hyogo (JP).
- (72)発明者; および
- (75)発明者/出願人(米国についてのみ): 下崎 新二(SHIMOSAKI, Shinji) [JP/JP]; 〒6608533 兵庫県尼崎市東浜町1番地 Hyogo (JP).
- 浜町1番地 住友チタニウム株式会社内 Hyogo (JP). 小笠原 忠司 (OGASAWARA, Tadashi) [JP/JP]; 〒6608533 兵庫県尼崎市東浜町1番地 住友チタニウム株式会社内 Hyogo (JP). 永岡 佐太延 (NAGAOKA, Sadanobu) [JP/JP]; 〒6608533 兵庫県尼崎市東浜町1番地 住友チタニウム株式会社内 Hyogo (JP). 正木 康浩 (MASAKI, Yasuhiro) [JP/JP]; 〒5410041 大阪府大阪市中央区北浜4丁目5番33号 住友金属工業株式会社内 Osaka (JP).
- (74)代理人: 広瀬 章一(HIROSE, Shoichi); 〒1030023 東京都中央区日本橋本町4丁目4番2号 東山ビル Tokyo (JP).
- (81)指定国(表示のない限り、全ての種類の国内保護が可能): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NI,

/続葉有/

(54)Title: METHOD FOR FORMING METAL OXIDE COATING FILM AND VAPOR DEPOSITION APPARATUS

(54)発明の名称: 金属酸化物被膜の成膜方法および蒸着装置



WO 2005/005686 A1

(57)Abstract: A photocatalyst composite material having a titanium oxide photocatalyst coating film on the surface of a base is produced by a CVD method wherein a TiCl<sub>4</sub> vapor is reacted with a water vapor. The TiCl<sub>4</sub> vapor and the water vapor are sprayed into a deposition chamber (9) respectively from nozzles (5) and (6) so that the spray streams of these vapors meet and thus are mixed with each other before reaching the base. The mixed vapor is brought into contact with a base (1) which is moving in one direction within 3 seconds from the mixing. It is preferable to spray the TiCl<sub>4</sub> vapor from a porous nozzle (5) in a direction opposite to the moving direction of the base while it is preferable to spray the water vapor from a slit nozzle (6) whose crossing angle to the base is smaller than that of the porous nozzle (5).

(57)要約: TiCl<sub>4</sub>蒸気と水蒸気とを反応させるCVD法により、基材表面に酸化チタン光触媒被膜を有する光触媒複合材を製造する。蒸着室(9)に、それぞれノズル(5)および(6)から、TiCl<sub>4</sub>蒸気および水蒸気を、それらの噴射流が基材に到着する前に交差するように噴射して、両蒸気を混合する。この混合から3秒以内に、混合蒸気を1方向に移動する基材(1)と接触させる。TiCl<sub>4</sub>蒸気は基材進行方向に対して逆向きに配置された多孔式ノズル(5)から、水蒸気は基材との交差角がより小さいスリット式ノズル(6)から噴射することが好ましい。



NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG,  
SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ,  
VC, VN, YU, ZA, ZM, ZW.

添付公開書類:  
— 國際調査報告書

(84) 指定国(表示のない限り、全ての種類の広域保護が可能): ARIPO (BW, GH, GM, KE, LS, MW, MZ, NA, SD,  
SL, SZ, TZ, UG, ZM, ZW), ユーラシア (AM, AZ, BY,  
KG, KZ, MD, RU, TJ, TM), ヨーロッパ (AT, BE, BG,  
CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE,  
IT, LU, MC, NL, PL, PT, RO, SE, SI, SK, TR), OAPI (BF,  
BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN,  
TD, TG).

(48) この訂正版の公開日: 2005年3月17日

(15) 訂正情報:  
PCTガゼットセクションIIのNo.11/2005(2005年3月  
17日)を参照

2文字コード及び他の略語については、定期発行される  
各PCTガゼットの巻頭に掲載されている「コードと略語  
のガイドスノート」を参照。

## INTERNATIONAL SEARCH REPORT

International application No.

PCT/JP2004/009903

## C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	JP 2000-64050 A (Asahi Glass Co., Ltd.), 29 February, 2000 (29.02.00), Full text (Family: none)	1-16
A	JP 7-3463 A (Glaverbel), 06 January, 1995 (06.01.95), Full text & GB 2274115 A & DE 4400208 A1 & DE 4400209 A1 & FR 2700325 A1 & FR 2700326 A1 & NL 9400041 A & NL 9400042 A & SE 9400037 A & SE 9400038 A & CA 2113028 A & CA 2113029 A & LU 88451 A & LU 88450 A & JP 7-2548 A & CZ 9400016 A3 & CZ 9400017 A & US 5522911 A & BE 1008559 A3 & BE 1008560 A3 & CH 687203 A5 & CH 687204 A5 & US 5709726 A & ES 2111418 A1 & ES 2112093 A1 & AT 9400014 A & AU 9400013 A & US 6112554 A	1-16
A	JP 7-110994 B2 (Elf Atochem North America, Inc.), 29 November, 1995 (29.11.95), Full text & WO 8900549 A & AU 8819344 A & ES 2009963 A & CN 1030946 A & FI 9000082 A & EP 370027 A & US 4928627 A	1-16
A	JP 5-195230 A (Sumitomo Electric Industries, Ltd.), 03 August, 1993 (03.08.93), Full text (Family: none)	1-16
A	JP 4-80371 A (Canon Inc.), 13 March, 1992 (13.03.92), Full text (Family: none)	1-16
A	JP 9-59777 A (Sekisui Chemical Co., Ltd.), 04 March, 1997 (04.03.97), Full text (Family: none)	1-16

## INTERNATIONAL SEARCH REPORT

International application No.

PCT/JP2004/009903

## A. CLASSIFICATION OF SUBJECT MATTER

Int.Cl<sup>7</sup> C23C16/40, C23C16/455, B01J35/02, C01G23/07

According to International Patent Classification (IPC) or to both national classification and IPC

## B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

Int.Cl<sup>7</sup> C23C16/00-16/56, C03C5/00-23/00, B01J35/02, C01G23/07

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Jitsuyo Shinan Koho	1922-1996	Jitsuyo Shinan Toroku Koho	1996-2004
Kokai Jitsuyo Shinan Koho	1971-2004	Toroku Jitsuyo Shinan Koho	1994-2004

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	JP 2000-266902 A (Inax Corp.), 29. September, 2000 (29.09.00), Full text (Family: none)	1-16
A	JP 61-50892 B2 (BFG Glassgroup), 06 November, 1986 (06.11.86), Full text & DE 2929092 A & GB 2026454 A & BE 877465 A & NL 7905581 A & SE 7906223 A & DK 7903057 A & FR 2456077 A & US 4293326 A & CA 1138725 A & IT 1120990 B	1-16

 Further documents are listed in the continuation of Box C. See patent family annex.

\* Special categories of cited documents:

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier application or patent but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

"&amp;" document member of the same patent family

Date of the actual completion of the international search

04 October, 2004 (04.10.04)

Date of mailing of the international search report

19 October, 2004 (19.10.04)

Name and mailing address of the ISA/  
Japanese Patent Office

Authorized officer

Facsimile No.

Telephone No.